Interactive comment on “Validation of northern latitude tropospheric emission spectrometer stare ozone profiles with ARC-IONS sondes during ARCTAS” by C. S. Boxe et al.

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Review of the paper

Validation of northern latitude tropospheric emission spectrometer stare ozone profiles with ARC-IONS sondes during ARCTAS by C. S. Boxe et al.

This paper focuses on validation of the TES ozone profiles with a series of coincident ozonesonde observations. The comparison uses version 3 and 4 of the TES retrieval of ozone from spectra recorded using the stare observation mode, along with ACTIONS sondes measurements taken during the ARCTAS artic field campaign.
Validation of satellite observations is an important step for further use of the remote sensed data. The paper provides a careful description of how the comparison was performed, and identifies some systematic bias for the TES ozone profile, in agreement with findings reported by previous publications. Using a stringent time and space coincidence criteria, the study shows that TES ozone profiles are reliable above 60°, and that the calculated errors are consistent with the observed errors.

I found the paper well written and useful, and I recommend its publication in ACP. I only have some minor remarks that could help to improve the clarity of the manuscript:

General comments - How can you be sure that the sounded air masses are about the same? The stare mode is at nadir only?

- Results are provided both for version 3 and version 4 of the data: 1/why both? Isn’t V4 supposed to be an improved version as compared to V3? 2/ the description of the improvement between the two versions is not provided, unless it is only the one step versus two steps retrieval process (page 27273) that differs? 3/ Both versions use a single a priori profile?

Detailed comments + typos

- page 27270 ligne 16: The IASI instrument also measures ozone profiles, eg A. Boynard et al, ACP 2009.

- page 27270 l29: Here it is said that the validation used 40 observations, whereas on page 27275 ligne 2 it says 55.

- page 27272 l2 Stare » stare

- page 27274 l1: The end of the sentence is weird.

- page 27274 l6-l10 check parenthesis

- page 27274 l10: It is written that the launches were timed for the early afternoon overpass and in the Table all the launch time are between 18 and 23h?
- page 27278: check equ. (8): check the indice of S (%?)
- page 27279 l4: Averaging » averaging
- page 27279 l7-8 and 27280 l10-11: twice the same is said
- page 27280 l25-26 end of sentence missing or parenthesis should be removed?
- page 27282 l24: better characterisation of the surface= better emissivity for the RT calculation?
- page 27284 l3: suggestion to put % values here, to be consistent with other values provided earlier same paragraph
- page27284 l18: (3): previous studies did not used the global survey mode?
- page27285 l8-l10: any explanation for the positive bias

References:
- find a way to distinguish the two Worden 2007
- Brasseur ref : tracewrs > traceurs
- Osterman ref: Spectrometree (remove e)

Tables:
- Table 1 and Table 2 are very similar I would suggest to combine them
- Table 3: How are the errors obtained as compared to profiles given in the plots? summed over the vertical?
- Table 4: Caption similar to Table 3: should be V004 instead?
Plots: the caption could be more explicit on what the subplots are.

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